

**TECHNICAL WORK MAY NOT BEGIN PRIOR TO CO APPROVAL**

NASA/GODDARD SPACE FLIGHT CENTER

**REQUEST FOR TASK PLAN / TASK ORDER**

CONTRACTOR:	CONTRACT NO./TASK NO.	JOB ORDER NUMBER	APPROP. FY
QSS Group, Inc.	NASS- 99124      TASK NO. 73      AMENDMENT	424-228-12-28-89	99

TASK TITLE: (NTE 80 characters; include Project name)

**OMI Interface Adapter Module**

APPROVALS: (Type or print name and sign)

ASSISTANT TECHNICAL REPRESENTATIVE (OR TASK MONITOR)	DATE	ORG CODE	MAIL CODE	PHONE
Steven S. Scott <i>Steven S. Scott</i>	5/3/99	730	424	301-286-2846
BRANCH HEAD	DATE	CODE	PHONE	
Margaret Luce <i>Margaret Luce</i>	5/3/99	424	301-286-6257	
CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR)	DATE	CODE	PHONE	
Fred Huegel <i>Deborah A. Clark</i>	5/4/99	568	301-286-2285	
FLIGHT HARDWARE, CRITICAL GSE OR SOFTWARE (IF YES, NEED CODE 303 CONCURRENCE NEXT BLOCK)	CONTRACTING OFFICER'S QUALITY REP.		DESIGNATED FAM:	
<input type="checkbox"/> NO <input checked="" type="checkbox"/> YES	<i>See for L. Moore per email</i> Larry Moore		<i>Ronald E. Renson</i> Ronald E. Renson	

The contractor shall identify and explain the reason for any deviations, exceptions, or conditional assumptions taken with respect to this Task Order or to any of the technical requirements of the Task Order Statement of Work and related specifications. The contractor shall complete and submit the required Reqs and Certs.

(To be completed by Contracting Officer)

C.O. Requested Quote on:

Date: MAY 12 1999

Contractor will develop specification or statement of work under this task for a future procurement. ☐ NO ☒ YES

Flight hardware will be shipped to GSFC for testing prior to final delivery. ☐ NO ☒ YES ☐ N/A

Government Furnished Property/Facilities: ☒ NO ☐ YES -- SEE LIST OF GFP (offsite only) / FACILITIES (onsite only)

Onsite Performance: ☒ NO ☐ YES      If yes: ☐ TOTAL ☐ PARTIAL  
If partial, indicate onsite work in SOW by asterisk (\*)

Surveillance Plan Attached: ☒ NO ☐ YES

Highlighted Contract Clauses: (to be completed by Contracting Officer)

Per Clause H.14, Task Ordering Procedure, subparagraph (f), the effective date of this task order shall be May 12, 1999.

**INCENTIVE FEE STRUCTURE (check one)**

(See Contract NAS5-99124, Attachment K, Incentive Fee Plan)

	<input checked="" type="checkbox"/> No. 1	No. 2	No. 3	No. 4	No. 5
Cost	10%	50%	25%	25%	%
Schedule	15%	25%	25%	50%	%
Technical	75%	25%	50%	25%	%

(To be completed by Contracting Officer)

The target cost of this task order is \$4,651,845.

The target fee of this task order is \$ 12,355.

The total target cost and target fee of this task order as contemplated by the Incentive Fee clause of this contract is \$ 4,664,200.

The maximum fee is \$ 18,057.

The minimum fee is \$0.

AUTHORIZED SIGNATURE:

THIS TASK ASSIGNMENT IS ISSUED ACCORDING TO THE CONTRACT CLAUSE "TASK ASSIGNMENTS AND REPORTS"

*Lorrie L. Eakin*  
SIGNATURE OF CONTRACTING OFFICER

11/24/99  
DATE

Lorrie L. Eakin  
Contracting Officer

TYPED NAME OF CONTRACTING OFFICER

CONTRACTOR'S ACCEPTANCE:

AUTHORIZED SIGNATURE

DATE

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QSS Group, Inc.	NAS5- 99124	73	

Applicable paragraphs from contract Statement of Work:

**STATEMENT OF WORK:** (Continue on blank paper if additional space is required)

See page 3.

**PERFORMANCE SPECIFICATIONS:**

See page 3.

**APPLICABLE DOCUMENTS:**

See page 3.

**TASK END DATE:** ~~XX/XX/XX~~ 12/31/00

**MILESTONES/DELIVERABLES AND DATES:**

See page 3.

**PERFORMANCE STANDARDS:**

**Schedule:** On time delivery/completion of the milestones/deliverables

**Technical:** ATR's acceptance of the deliverables

**FINAL DELIVERY DESTINATION (NAME, BLDG, ROOM):**

Steven S. Scott, building 16W, room N240C

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***EOS Chemistry Mission*****STATEMENT OF WORK:**

The contractor shall specify, design, develop, build, test, deliver, integrate with the EOS Common Spacecraft and OMI Instrument, document, and maintain for the life of the EOS Chemistry Mission a GIRD-compliant Interface Adapter Module (IAM) for the Ozone Monitoring Instrument (OMI). The contractor shall provide a fully redundant Engineering Model for Early Interface and Integration Testing and a fully redundant Proto Flight Model for final delivery and integration with the EOS Chemistry Bus and OMI. The OMI IAM shall include the necessary hardware and software to compress the science data stream relayed through it.

***Background:***

The TRW-built EOS Common Spacecraft Bus that will be used on the EOS Chemistry Mission expects General Interface Requirements Document (GIRD) compliant Instruments for Bus Integration and accommodation. The baseline OMI Instrument does not provide a GIRD-compliant interface to the EOS Chemistry Spacecraft Bus. The OMI IAM will provide a GIRD-compliant Interface for the OMI to the EOS Chemistry Spacecraft Bus.

***Objectives:***

The contractor shall specify, design, develop, build, test, deliver, integrate with the EOS Chemistry Spacecraft and OMI Instrument, document, and maintain for the life of the EOS Chemistry Mission (TBR) a GIRD-compliant Interface Adapter Module (IAM) for the Ozone Monitoring Instrument (OMI). The IAM shall provide a GIRD-compliant interface between the OMI Instrument and the TRW-built EOS Chemistry Spacecraft Bus. The OMI IAM shall also include the necessary hardware and software to compress the science data stream relayed through it.

***Requirements:***

The contractor shall specify, design, develop, build, test, deliver, integrate with the EOS Chemistry Spacecraft and OMI Instrument, document, and maintain for the life of the EOS Chemistry Mission (TBR) a GIRD-compliant Interface Adapter Module (IAM) for the Ozone Monitoring Instrument (OMI).

The OMI IAM shall have an on-orbit reliability of 85 percent for the life of the EOS Chemistry Mission (meaning there shall be a greater than 85 percent probability that the OMI IAM will meet its requirements and function as intended for the life of the EOS Chemistry Mission). High reliability components and/or redundancy shall be provided to meet this requirement. The contractor shall provide reliability, failure modes and effects, and worst case analyses to demonstrate or prove analytically that it meets the OMI IAM reliability requirements.

The contractor shall develop a technical specification and Statement of Work for the OMI IAM as described above.

The contractor shall participate in EOS Chemistry and OMI ICD Working Group Meetings.

The contractor shall establish and maintain direct communications with the OMI supplier and the EOS Chemistry Spacecraft Bus supplier for development of the OMI IAM.

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The contractor shall define all hardware, software, firmware, assurance, and operational requirements for the OMI IAM in the OMI IAM Technical Specification.

The contractor shall conduct reviews as described below.

The contractor shall provide documentation as described below.

The contractor shall provide Finite Element Analyses and Finite Element Models for the flight hardware supplied under this task.

The contractor shall define all material requirements subject to the requirements below.

The contractor shall provide the deliverables listed below in the "Deliverables" section of this task statement and shall provide a full list of deliverable items including ones that the contractor determines are required but are not mentioned specifically below.

The contractor shall provide an integrated schedule for fulfillment of the requirements and provision of the deliverables listed below. This schedule shall describe all activities that will be undertaken on this task and shall identify critical path items and slack in major activities. The schedule shall be subject to NASA GSFC review and approval.

The contractor shall provide all parts, including long lead parts, consistent with the radiation requirements and environment of the EOS Chemistry Mission Orbit and the assurance requirements listed below.

The contractor shall provide the Electrical Ground Support Equipment (EGSE), Mechanical Ground Support Equipment (MGSE), and Transportation Container(s) for the OMI IAM EM and PFM. The EGSE shall include simulation of both the Spacecraft and OMI sides of the IAM interfaces for independent checkout of the OMI IAM. Two full copies of the EGSE shall be provided to ensure the capability for simultaneous early integration testing with the fully redundant Engineering Model and development testing of the Proto Flight Model IAM's.

The contractor shall provide the necessary qualified personnel to accomplish the work defined in this task.

The contractor shall provide NASA-certified personnel for building, inspecting, and handling the flight hardware developed under this task.

Flight hardware, software, and firmware shall meet the requirements of the applicable documents listed below as well as the requirements specified by the contractor and approved by NASA GSFC for this task.

The contractor is encouraged to make maximal use of existing hardware, software, designs, documents, and operational procedures in the fulfillment of this task. For heritage hardware, the contractor is encouraged to make maximal reuse of existing analyses (e.g., reliability and finite element models) and documentation where applicable.

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**Testing:**

The contractor shall provide a plan for testing the OMI IAM to verify that it meets all its requirements and functions as intended (i.e., provides a GIRD-compliant interface between the OMI Instrument and EOS Chemistry Spacecraft Bus as proven by qualification testing). This plan shall be subject to NASA GSFC review and approval.

Maintenance/Post-Launch Support XXRESERVEDX

The contractor shall provide maintenance and job related support for the XOMX NAVI PROX FIGHT PROGRAM for the life of the EGS Chemistry Division.

### Reviews:

The contractor shall conduct the following System-level (box-level) reviews for the OMI IAM in accordance with GSFC Systems Review Office Guidelines for Reviews (available on the GSFC Web site at <http://www.gsfc.nasa.gov> or <http://arioch.gsfc.nasa.gov/301/html/design.html>):

Concept Review (CR).

Requirements Review (RR).

Preliminary Design Review (PDR).

Critical Design Review (CDR).

Pre-Environmental Review (PER).

Pre-Ship Review (PSR).

In addition, the contractor shall provide input to other system-level reviews (e.g., Observatory Pre-Ship Review, Flight Readiness Review, etc.).

The contractor shall conduct the following Software reviews (if software is a major component of the OMI IAM):

Software Concept Review (SWCR).

Software Requirements Review (SWRR).

Software Preliminary Design Review (SWPDR).

Software Critical Design Review (SWCDR).

Software Test Readiness Review (SWTRR).

Software Acceptance Review (SWAR).

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Software Reviews may be combined with box-level reviews, as appropriate, with NASA GSFC approval.

The contractor shall develop a schedule for these reviews that is consistent with the overall OMI IAM delivery schedule. The contractor may combine (e.g., combine PDR and CDR into a Mission Design Review, MDR) reviews or add reviews (e.g., software build/release reviews) as appropriate subject to government approval. All schedules shall be subject to NASA GSFC approval.

***Deliverables:***

The OMI IAM Contractor shall deliver the following items:

A fully redundant Interface Adapter Module (IAM) Engineering Model (EM), 8 months (TBR) after the start of this task.

A fully-redundant Interface Adapter Module (IAM) Proto Flight Module (PFM), 18 months (TBR) after the start of this task.

Both Engineering and Proto Flight Model OMI IAM's shall include the necessary hardware and software to compress the data stream relayed through it.

Cables and Harnesses for connection of the OMI IAM to the EOS Chemistry Spacecraft and OMI Instrument consistent with the GIRD requirements.

Two full copies of the Electrical Ground Support Equipment (EGSE) required to conduct the testing, validation, and operations of the OMI IAM.

Software Source and Executable Code for the OMI IAM EM and IAM PFM.

All software documentation and source code necessary for the full understanding of and maintenance of the flight software, including Software Source and Executable Code for the OMI IAM EM and OMI IAM PFM, flowcharts, algorithms, design documents, compilers, linkers, debuggers, operating instructions and manuals, etc.

All Technical Drawings for the OMI IAM EM and PFM.

Telemetry and Command Database for the OMI IAM.

***Documents:***

The contractor shall provide a list of documentation it will deliver under the provisions of this task. As a minimum, the contractor shall provide the following:

OMI IAM Implementation Plan.

OMI IAM to EOS Chemistry Spacecraft and Ozone Monitoring Instrument Interface Control Document.

OMI IAM Technical Specification.

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OMI IAM Software Requirements Specification.

OMI IAM Detailed Design Description.

OMI IAM Software Detailed Design Description.

OMI IAM Test Plan.

OMI IAM Software Test Plan.

OMI IAM Test Report.

OMI IAM Software Test Report.

OMI IAM Software Version Design Descriptions.

OMI IAM Firmware Support Manual.

OMI IAM Users and Maintenance Manual.

OMI IAM EGSE Design, User, and Maintenance Manual.

OMI IAM Telemetry and Command Handbook.

All Software Source Code for the OMI IAM EM and IAM PFM.

All Technical Drawings for the OMI IAM EM and PFM.

Documentation listed above (particularly software-specific documentation) may be combined as appropriate with NASA GSFC approval. The contractor is encouraged to make maximal use of existing documentation in preparing the above OMI IAM documentation.

***Assurance Requirements:***

The OMI IAM shall comply with the assurance requirements of the Earth Observing System (EOS) Performance Assurance Requirements for EOS Common Spacecraft, GSFC 420-05-04, January 3, 1994, and the Mission Assurance Requirements for the Ozone Monitoring Instrument (424-11-13-03, February 1999). All exceptions to these requirements shall require the prior agreement or approval of NASA GSFC.

***Travel and Meetings:***

The contractor shall attend EOS Common Spacecraft Bus and OMI Instrument Reviews and Meetings relevant to the performance of this task.

Travel to TRW, Redondo Beach, CA and NIVR, the Netherlands shall be required under this contract.

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**PERFORMANCE SPECIFICATIONS (Inspection, and Acceptance):**

The government shall inspect and accept the IAM EM and IAM PFM in accordance with the assurance requirements above and the GIRD Interface Requirements (EOS Common General Interface Requirements Document (GIRD), GSFC 422-11-12-01). Integration and environmental testing shall be performed in accordance with the assurance requirements above and the OMI IAM technical specification, to be delivered by the contractor for NASA GSFC approval. The contractor shall show that all requirements for the OMI IAM are verified and that the OMI IAM works as intended (i.e., provides a GIRD-compliant interface between the OMI Instrument and EOS Chemistry Spacecraft Bus as proven by qualification testing) prior to NASA GSFC acceptance. The contractor shall provide a list of documentation it will deliver under the provisions of this task. As a minimum, the contractor shall provide documentation listed in the Documents section above. Software documentation shall be consistent with NASA-STD-2100-91, NASA-STD-2201-93 (or comparable IEEE or ANSI or ISO standards with NASA GSFC approval). The contractor shall conduct the System-level (box-level) reviews listed above for the OMI IAM in accordance with GSFC Systems Review Office Guidelines for Reviews (available on the GSFC Web site at <http://www.gsfc.nasa.gov> or <http://arioch.gsfc.nasa.gov/301/html/design.html>).

**APPLICABLE DOCUMENTS:**

The following Applicable Documents and all the requirements contained therein for the OMI IAM shall apply (with government-approved tailoring) to this task:

EOS Common General Interface Requirements Document (GIRD), GSFC 422-11-12-01.

Unique Instrument Interface Document (UIID) for the Ozone Monitoring Instrument (OMI), EOS Chemistry Project, GSFC 424-28-28-02, September 1998.

Interface Control Document (ICD) for the Ozone Monitoring Instrument (OMI), EOS Common Spacecraft Project, January 29, 1999.

Earth Observing System (EOS) Performance Assurance Requirements for EOS Common Spacecraft, GSFC 420-05-04, January 3, 1994.

Mission Assurance Requirements for the Ozone Monitoring Instrument (424-11-13-03, February 1999).

Instrument Software Management Plan for the EOS Chemistry Spacecraft Instruments (424-28-01-11, March 31, 1995).

The following Reference Documents for the OMI IAM may be referenced on this task:

See reference sections in the above documents.

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**MILESTONES/DELIVERABLES AND DATES:**

The contractor shall provide a delivery schedule with appropriate milestones consistent with the requirements of this task. The delivery schedule shall be provided within 15 days of the start of this task and shall be subject to NASA GSFC review and approval.

The contractor shall deliver a fully redundant OMI IAM Engineering Model (EM) with data compression capability and associated EGSE 8 months after the start of this task.

The contractor shall deliver an OMI Proto Flight (PFM) with data compression capability and associated EGSE 18 months after the start of this task.

The contractor shall deliver cables and harnesses necessary to connect the IAM EM and PFM with the OMI Instrument and EOS Chemistry Spacecraft Bus in accordance with the delivery times listed above for EM and PFM deliveries.

Two full copies of the Electrical Ground Support Equipment (EGSE) required to conduct the testing, validation, and operations of the OMI IAM EM (8 months) and PFM (18 months).

Software Source and Executable Code for the OMI IAM EM and IAM PFM in accordance with the delivery times listed above for EM and PFM deliveries.

All software documentation and source code necessary for the full understanding of and maintenance of the flight software, including Software Source and Executable Code for the OMI IAM EM and OMI IAM PFM, flowcharts, algorithms, design documents, compilers, linkers, debuggers, operating instructions and manuals, etc., in accordance with the delivery times listed above for EM and PFM deliveries.

All Technical Drawings for the OMI IAM EM (8 months) and PFM (18 months).

Telemetry and Command Database for the OMI IAM with EM and PFM deliveries and updates and corrections as required.

The contractor shall deliver the OMI IAM EM to NIVR for early integration testing with the OMI Instrument in accordance with the delivery times listed above for EM and PFM deliveries.

The contractor shall deliver the OMI IAM EM to TRW for early integration testing with the EOS Chemistry Spacecraft Bus in accordance with the delivery times listed above for EM and PFM deliveries.

The contractor shall deliver the OMI IAM PFM to TRW for integration with the OMI Instrument and EOS Chemistry Spacecraft Bus in accordance with the delivery times listed above for EM and PFM deliveries.

The contractor shall deliver the OMI IAM EM to the Independent Verification and Validation Facility (IVVF) facility at location TBD for integration with the on-orbit maintenance facility after it has completed its purposes in Integration and Testing in accordance with the delivery times listed above for EM and PFM deliveries.